

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RAPHAEL L. LEVIEN

Appeal No. 1996-3621
Application No. 08/019,783¹

ON BRIEF

Before HAIRSTON, LALL and GROSS, Administrative Patent Judges.
HAIRSTON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1 through 32.

The disclosed invention relates to a system and method for rotating a stored image by a given angle of rotation. The stored image is initially skewed in a vertical direction by a vertical skew to form a vertically skewed image. Thereafter,

¹ Application for patent filed February 19, 1993.

the vertically skewed image is interpolated to form an interpolated vertically skewed image. Finally, the interpolated vertically skewed image is skewed in a horizontal direction by a horizontal skew to form a rotated image.

Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. In a system for rotating a stored image by a given angle of rotation, a method comprising:

scanning a plurality of input points of an original of said image for reading a plurality of input image pixels corresponding to said image, wherein said scanning defines a horizontal direction as the direction of said scanning forming a plurality of horizontal scan lines of input image pixels, and defines a vertical direction as substantially perpendicular to said horizontal direction;

storing said plurality of input image pixels in a memory to

form said stored image, wherein said input image pixels are stored in said memory such that adjacent pixels in a given memory location are in substantially the same order as said plurality of input image pixels along said horizontal direction;

skewing said stored image in a vertical direction by a vertical skew to form a vertical skewed image;

interpolating said vertical skewed image to form an interpolated vertical skewed image; and

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skewing said interpolated vertical skewed image in a horizontal direction by a horizontal skew to form a rotated image.

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The references relied on by the examiner are:

Searby 1986	4,611,232	Sept. 9,
Tabata et al. (Tabata) 1986	4,618,991	Oct. 21,
Aoki 8, 1987	4,712,185	Dec.

Claims 2, 3, 8, 9, 14, 15, 20, 21, 26, 27, 30 and 31 stand rejected under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

Claims 1, 4 through 7, 10 through 13, 16 through 19, 22 through 25, 28, 29 and 32 stand rejected under 35 U.S.C. § 103 as being unpatentable over Tabata in view of Searby and Aoki.

Reference is made to the briefs and the answers for the respective positions of the appellant and the examiner.

OPINION

All of the rejections are reversed.

Turning first as we must to the indefiniteness rejection, the examiner states (Answer, page 4) that:

In each of these claims recitation is made to "interpolating" the image data by a factor (such as 2 or 4). However, the process recited as being "interpolation" actually appears to be a recitation

of a scaling or size change. Interpolation is a process that will fill in values between adjacent values so as to form a continuous string of data. The process recited in the claims only recites the addition of pixels (either two or four times the original number of pixels) and does not in any way recite an interpolation process as "interpolation" is conventionally defined. While interpolation may well be part of a size change operation (such as to fill in values for the expanded image pixels), interpolation in and of itself is not size change. These claims only recite that the process is one of a size change and these claims (as well as the other claims that are further defined by these claims) are interpreted as such for the application of prior art.

According to the appellant (Brief, page 10), "even though interpolation can be used for scaling an image, scaling an image is not always interpolating the image." "Appellant's specification states on page 3 line 3, that 'to smooth the transitions between pixels of the rotated image, interpolation is used to add pixels to the rotated image . . .'" (Brief, page 11). Appellant's position, therefore, is that "the term 'interpolate' is both defined by applicant in his own specification and is consistent with the accepted definition of the term" (Brief, page 11). "There is no requirement by statute . . . that an otherwise definite term . . . 'interpolate' be mutually exclusive with another term

'scaling'" (Brief, page 11). A summary of appellant's position is that "[i]t does not matter what 'scaling' means, it only matters what 'interpolate' means, for the claims do not use the term 'scaling'" (Brief, page 12).

Although scaling may coincidentally occur as pixels are added to the image during the claimed interpolation step, appellant is not required to describe his claimed invention as a scaling process. As appellant correctly noted (Brief, page 12), the disclosed and claimed invention is directed to a system and process for interpolating an image, and not to a system and method for scaling an image. In fact, any attempt by appellant to claim the scaling of an image would probably be met with a lack of written description rejection under the first paragraph of 35 U.S.C. § 112. After review of the complete record, we find that interpolation, and not scaling, is what the "applicant regards as his invention" under the second paragraph of 35 U.S.C. § 112. In summary, the indefiniteness rejection is reversed because the examiner has not convinced us to reach a different result.

Turning to the obviousness rejection, the examiner indicates (Answer, page 5) that Tabata discloses skewing image

data in a vertical direction followed by scaling the skewed image, and then skewing the image data in a horizontal direction. The examiner is of the opinion (Answer, pages 5 and 6) that:

While Tabata does perform a scaling process as part of the skewing process, the reference does not indicate that the scaling is performed using interpolation, such as recited in the independent claims in general, and more specifically recited in various dependent claims. Searby and Aoki are cited as showing the conventionality of interpolation processing as part of a rotation processing . . . To one of ordinary skill in the art, it would have been obvious, at the time of the invention, to use the interpolation processes of Searby and Aoki as the scaling process of Tabata because of the conventionality of the use of interpolation processes as part of a scaling operation and because each of the systems are for performing the rotation of image data and include the process of changing the size of the image data as part of the rotation process.

Appellant argues (Brief, page 5) that the claimed subject matter has "V skew, then interpolation, then H skew," whereas Tabata has "H skew first, scaling (enlargement or reduction), and V skew last," Searby has rotation by a trigonometric calculation, and then interpolation to find one pixel value between two rotated lines, and Aoki has rotation by a trigonometric calculation, and then interpolation of data

along an inclined line after rotation. According to appellant (Brief, page 6):

The issue is whether it would be obvious to one skilled in the art to assemble and rearrange pieces of the prior art process. At first glance, it does not appear to matter in what order the various skews or the interpolation steps take place. (Regardless, the fact does remain that the prior art does not show nor suggest the claimed subject matter.)

We agree with the appellant (Reply Brief, page 3) that the cited references neither teach nor would they have fairly suggested "the claimed order of process steps to one of ordinary skill in the art." As indicated supra, scaling and interpolation are not recognized as equivalents in the art. The prior art cited by the examiner certainly has not demonstrated such a fact. Nor has the examiner presented a convincing line of reasoning as to why the skilled artisan would have known that the two techniques are the same. A mere statement by the examiner that they are the same can not take the place of evidence or a convincing line of reasoning in the record. The same holds true for the examiner's dismissal of the importance of performing the disclosed and claimed vertical skew prior to interpolation and the horizontal skew.

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In short, the obviousness rejection is reversed because the examiner has not presented a prima facie case of obviousness.

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DECISION

All of the rejections have been reversed. As a result thereof, the decision of the examiner is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
PARSHOTAM S. LALL)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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ANITA PELLMAN GROSS)	
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